REMARKS

Claim Status

Claims 1-24 and 26-29 are pending in the application. This paper amends claims 1, 2, 7, 11-13, 19, 23, 24, and 28; and cancels claim 25. Claims 1, 5, 6, 11, 12, 17, 18, 23, and 24 are the independent claims of the instant application.

Amendment of Specification and Drawings

In the Office Action, the Examiner requested that the reference to a related patent application be updated. Accordingly, the specification has been amended to recite the serial number of the related application.

The Examiner also objected to the drawings because Figure 1 did not include reference numerals "121" mentioned in the description. We have amended Figure 1 by placing thereon the reference numerals "121." Other Figures have not been amended. The objection is believed to be obviated by the submission of the replacement drawing sheet attached to this paper.

Section 112 Rejections

Claims 1-4, 7, and 12-16 were rejected under 35 U.S.C. §112, second paragraph. In particular, the Office Action stated that the limitations of "said task," "said association," and "said processor" in claims 1, 2, 7, 12, and 13 did not have sufficient antecedent basis. The above amendments either strike the word "said" from these limitations or otherwise provide sufficient

antecedent basis for the limitations. The rejection is believed to be obviated by the claim amendments.

Section 101 Rejection

Claim 23 was rejected under 35 U.S.C. §101 as directed to non-statutory subject matter. According to the Office Action, claim 23 simply recited a statement that failed to distinctly claim a process, machine or manufacture. Claim 23 has now been amended to recite a process.

Art Rejections

Claims 1-9, 11-15, 17-21, and 23-28 were rejected under 35 U.S.C. §102(b) as being anticipated by Frank *et al.*, U.S. Patent Number 5,790,851 ("Frank" hereinafter). Claims 5 and 23 were further rejected under 35 U.S.C. §102(e) as being anticipated by Rehg *et al.*, U.S. Patent Application Publication Number 2002/0091748 ("Rehg" hereinafter). Claims 10, 16, 22, and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over Frank in view of Zolnowsky, U.S. Patent Number 5,826,081 ("Zolnowsky"). We respectfully respond to these rejections.

Regarding rejections of claims as anticipated by Frank or unpatentable over Frank in view of Zolnowsky, the Office Action states that Frank discloses each task being associated with one of a plurality of scheduling domains, and the step of prohibiting more than one task associated with the same scheduling domain from running concurrently. Specifically, the Office Action points to Frank, column 6, lines 4-29, 44-48, and 57-62; column 8, lines 15-29 and 43-67; column 9, lines 1-11; and Figures 2B, 2C, 5, 6A, and 6B, as disclosing these limitations. We have reviewed the cited text and Figures, but have not been able to identify such disclosure. Indeed, it appears that Frank expressly

teaches the use of locks for synchronizing access to shared resources, rather than the use of scheduling domains: "Any of the shared resources 102*a*, 104*a*, and 109 can be accessed by any processor of processors 101(1)-101(8) after its associated access request is synchronized by obtaining a lock." Frank, col. 6, lines 11-14. Frank also acknowledges that the processors are generally capable of simultaneously executing respective processes:

> Within the SMP configuration 110 of FIG. 2B, *each processor of processors 101(1)-101(8) is capable of simultaneously executing a respective process.* A scheduler within the operating system, which is one of the executed processes, determines which processor will execute which process and when in accordance with well know techniques. In order to avoid the spinlock contention between processors 101(1)-101(8), the present invention implements the arbitration mechanism that is described below.

Frank, col. 6, lines 20-28 (emphasis added).

Frank's description of how the arbitration mechanism avoids spinlock also leaves little doubt that processes can run concurrently: "During the time while a process of 1-n is waiting in the queue 220 of the present invention, it can perform useful processing tasks." Frank, col. 6, lines 60-62. Thus, each processor of Frank's system is capable of simultaneously executing a respective process, even while waiting in a queue for a lock to a shared resource. When one process has the lock to a shared resource, other processes waiting in queue for the same resource execute other useful tasks. Frank does not teach the use of scheduling domains whereby only one task associated with the scheduling domain can run at the same time, as recited in independent claims 1, 6, 12, 18, and 24.

Independent claims 5, 11, 17, and 23 recite "implicit synchronization." This expression is defined and described in detail in specification of the instant application. For example, the specification teaches that "[t]he invention provides implicit synchronization, in which resources are

synchronized by operation of the scheduling domain restrictions described herein." Application,

page 11, lines 13-15. Operation of scheduling domains is also defined in the specification:

> • scheduling domain — in general, a set of tasks and resources selected by designers or program coders for operation in a multiprocessor system, where it's understood that only one task in the set is allowed to run and access the resources at any given time. Multiple tasks from different scheduling domains can run concurrently.

Application, page 10, line 20, through page 11, line 2. The specification also contrasts implicit

synchronization of the invention with explicit synchronization:

> With explicit synchronization, a first task 121 and a second task 121 each attempt to access a shared resource 122, such as a data structure. To prevent improper concurrent access to the shared resource 122, each task 121 makes explicit calls 601 to a synchronization mechanism 602. The synchronization mechanism 602 might include a lock, a semaphore, a monitor, or other methods known in the art of operating systems.

> *With implicit synchronization, it is assumed by the application that the scheduler will provide the synchronization, by not running multiple tasks in the same domain concurrently.* The first task 121 and the second task 121 each have an associated scheduling domain 123. If the two scheduling domains 123 are different, that indicates a designer's or program coder's decision that the two tasks 121 will not perform improper concurrent access to the shared resource 122 (in alternative embodiments, different scheduling domains 123 may indicate that if there is any improper concurrent access to the shared resource 122, no harm will come to the system 100). If the two scheduling domains 123 are the same, that indicates a designer's or program coder's decision that the two tasks 121 might perform improper concurrent access to the shared resource 122, thus that the two tasks 121 are not allowed to execute concurrently.

Application, page 21, lines 6-22 (emphasis added). Therefore, the "implicit synchronization"

limitations in claims 5, 11, 17, and 24 are similar or identical to prohibiting more than one task from

running in the same domain. As discussed above in relation to claims 1, 6, 12, 18, and 24, Frank

does not disclose this limitation.

Turning next to rejection of claims 5 and 23 as anticipated by Rehg, the Office Action cites numbered paragraphs [0050], [0052], and [0053] of the reference as disclosing all limitations of these claims. Rehg indeed mentions "data access primitives for reading and writing time stamped data items. These primitives implicitly handle synchronization between producers and consumers of data items and garbage collection of data items that are no longer needed." Rehg, paragraph [0053]. Rehg, however, does not describe the data access primitives, and does not disclose how the primitives achieve synchronization. Rehg does not describe "implicit synchronization" as the Applicants, being their own lexicographers, defined that that term in the instant application. Specifically, Rehg does not describe the use of "scheduling domains" and prohibiting more than one process from running concurrently in the same domain. We respectfully request that the claims be construed using the definition of "implicit synchronization" provided by the instant application.

In the above discussion, we have addressed patentability of all pending independent claims. As regards dependent claims not specifically discussed, these claims are patentable together with their base claims and intervening claims, if any.

CONCLUSION

For the foregoing reasons. Applicants respectfully submit that all pending claims meet the requirements of 35 U.S.C. §§101 and 112, and are patentable over the references cited in the Office Action. To discuss any matter pertaining to the present application, the Examiner is invited to call the undersigned attorney at (858) 720-9431.

Having made an effort to bring the application in condition for allowance, a timely notice to this effect is earnestly solicited.

Respectfully submitted,

Dated: September 24, 2004

Anatoly S. Weiser
Reg. No. 43,229

The Swernofsky Law Group
P.O. Box 390013
Mountain View. CA 94039-0013
(650) 947-0700

DRAWING AMENDMENT

One drawing replacement sheet (Figure 1) is attached to this paper.